Space Weather Forecast

Issued on Saturday 8 February 2025 at 13:00 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate flares likely throughout. Minor geomagnetic storm likely from Day 2 (09 Feb).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with one Moderate-class flare, at 08/0927 UTC from the complex region in the northwest.

There are now ten active regions on the Earth-facing disc. The majority of interest is in the northwest quadrant, with a cluster of entwined regions. The rearmost spot remains the largest and most complex region on the visible disc, with two notable delta regions. The spots in the northwest have show signs of decay in recent imagery, with their intermediate spots fading. The other regions within this cluster are close together and it is difficult to define the exact boundaries of each region. As such they are magnetically interconnected, with interaction between the various regions. The remaining regions on the disc are small and simple at present.

A partial halo coronal mass ejection (CME) was present in coronagraph imagery in the early hours of 08 Feb, this has good confidence that its far-sided and isn't expected to produce any impacts at Earth.

Solar Wind / Geomagnetic Activity: Solar winds showed a declining trend from possible coronal hole fast winds back to background. Wind speeds were initially slightly elevated, declining gradually to slow-ambient speeds. The Interplanetary Magnetic Field was weak. The north-south component, Bz, was weak and predominantly northward directed. Geomagnetic activity was Quiet (Kp 0-1).

Solar wind speeds were at slow ambient levels, around 350km/s. The Interplanetary Magnetic Field, was initially weak, with a slight rising trend to become moderate. The north-south component, was initially variable then between 08/0730 and 08/0930 UTC became largely was positive. Then from 08/0930 UTC became predominantly southwards directed. Geomagnetic activity was mainly Quiet (Kp 0-1) with a brief Unsettled (Kp3) interval between 08/0600-08/0900 UTC.

Energetic Particles / Solar Radiation: High energy proton flux remained at background levels.

Four-Day Space Weather Forecast Summary

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Solar Activity: Moderate activity is expected to continue, with a slight chance of a strong flare, primarily from the cluster of regions in the northwest.

Solar Wind / Geomagnetic Activity: There is a slight chance of up to three glancing coronal mass ejections through the period, one on Day 1, and the other two on Days 3 or 4.

Solar winds are currently slow-ambient. The next feature is a High Speed Stream which is expected to arrive during Day 2 (09 Feb), perhaps more likely during the second half of the day, lasting into Day 3 (10 Feb). Solar winds are expected to become elevated to potentially strong.

Predominantly Quiet to Unsettled (Kp 0-3) geomagnetic activity is expected, with a slight chance of Active to G1/Minor Storm intervals if we do see any CME influence day 1 and day 4 (08 and 11 Feb). Activity is then expected to increase during days 2 and 3 (09/10 Feb) due to the HSS from CH13, perhaps with some limited CME influence, becoming Active to G1/Minor storm (Kp 4-5) with a slight chance of G2/Moderate storm intervals (Kp 6).

Predominantly Quiet to Unsettled (Kp 0-3) geomagnetic activity is expected, with a slight chance of Active to G1/Minor Storm intervals if we do see any CME influence on Day 1. Activity is then expected to increase from Day 2 (09 Feb) due to a connection to fast winds from a coronal hole, likely becoming Active to G1/Minor storm (Kp4/5) with a very slight chance of G2/Moderate storm intervals (Kp6). On Day 4 (11 Feb) likely continuing with the Active to G1/Minor storms, with the combined risk of the CME arrivals and potential connection to further fast winds.

Energetic Particles / Solar Radiation: There is a slight chance of energetic particles rising above the S1/Minor radiation storm threshold as the cluster of sunspots in the northwest are now in a good position to connect with Earth, should there be further large flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	No	20	60	50	60
Strong	**G3**	No	1	5	5	5
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

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Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	Yes	70	70	70	70
Very Active	R3-R5 (X Class)	No	20	20	20	20

Solar Radiation Storms (High Energy Protons)

Radiation Storms	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	5	5	5	5
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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